

REMARKS

A substitute specification has been filed in order to correct typographical errors, to clarify portions of the description and to format the specification according to USPTO requirements. Further, all previously pending claims have been canceled and new claims 70-112 have been added. No new matter has been added. Entry and reconsideration of the substitute specification and new claims are respectfully requested.

In the non-final Office Action mailed October 21, 2002, the Examiner objected to the form of the specification. A substitute specification has been filed herewith in order to overcome the formality objections. No new matter has been added to the substitute specification. Pursuant to Rule 125 and MPEP 608.01(q), a marked up (red-lined) version of the substitute specification is also enclosed herewith in order to show all changes to the original specification. Paragraph numbering has been added for convenience in the further prosecution of this application.

In addition, the Examiner requested clean copies of the attachments to the previous Amendment filed in this application and clean copies are attached hereto for the Examiner's consideration. However, further reliance upon this evidence is not requested in view of the newly submitted claims and the arguments and evidence discussed herein.

Claims 56-58, 60-64 and 69 were rejected as being indefinite. Because these claims have been canceled, this indefiniteness rejection is mooted. However, Applicants have fully considered the Examiner's comments and have made efforts to

avoid including indefinite passages in the new claims.

Claims 68, 48-50 and 53 were rejected as containing new subject matter. Again, because these claims have been canceled, this rejection is mooted. However, Applicants have fully considered the Examiner's comments in this regard and believe that the new claims are entirely supported by the original specification.

Further, claims 50, 51 and 53 also were rejected as being indefinite. Because these claims have been canceled, this indefiniteness rejection is again mooted. However, Applicants have fully considered the Examiner's comments and have made efforts to avoid including indefinite passages in the new claims.

Claim 49 was objected to as being an improper dependent claim. Again, claim 49 has been canceled and the new dependent claims are believed to be in proper form.

Claims 68, 48-50 and 53 were rejected under 102(b) as being anticipated by EP 475 596. Because these rejected claims have been canceled by this Amendment, Applicants will provide distinguishing arguments with respect to the newly submitted claims. Before providing distinguishing arguments concerning the new claims, however, Applicants will provide a brief summary of the teachings of EP 475 596.

EP 475 596 essentially teaches a two-step cleaning process. In the first step, a dirty object is contacted with a terpene solvent and in the second step, the cleaned object is contacted with an aqueous medium and/or low boiling solvent in order to form an azeotrope. See column 2, line 55 to column 3, line 6. The terpene solvent contains at least 50% cymene, menthane and/or menthane. See column 3, lines 52-53. There is no mention of the terpene solvent containing any water. The terpene solvent is

disposed within a tank 1 provided with an ultrasonic generator 2. See column 8, lines 55-59 and Figure 1.

After cleaning the dirty object with the terpene solvent, the cleaned object is sprayed with or immersed in the aqueous medium, which aqueous medium is disposed within a second tank 5 that is equipped with a heater 6. See column 6, line 53 to column 7, line 17 and column 9, lines 1-5. The second tank does not include an ultrasonic generator or any means for agitating the aqueous medium, because the primary purpose of contacting the cleaned object with the aqueous medium is to form an azeotrope. However, to the extent that water soluble contamination is removed from the cleaned object by the aqueous medium (see column 7, lines 27-33), it is noted that such cleaning of water soluble contamination is performed entirely separately from cleaning hydrophobic contamination by the terpene solvent. Further, EP 475 596 contains no mention that the aqueous medium is a two-phase solution or an emulsion, or that the concentration of the low boiling solvent (which is optional in the aqueous medium according to EP 475 596) is greater than its solubility in water.

Thus, claims 70, 83 and 98 distinguish from EP 475 596 for at least the reason that EP 475 596 does not teach or suggest contacting an object to be cleaned with a liquid cleaning composition comprising between 65-99% water and at least one organic compound having lipophilic and hydrophilic groups, wherein the liquid cleaning composition is a two-phase solution in the state of an emulsion, in which a plurality of organic-rich droplets are suspended in a continuous aqueous phase. The terpene solvent of EP 475 596 does not include at least 65% water. Further, the aqueous

medium of EP 475 596 is not agitated or otherwise caused to be maintained as an emulsion, such as by applying ultrasound. In fact, EP 475 596 does not teach or suggest that the aqueous medium can be a two-phase solution or an emulsion and instead teaches a person of skill in the art to utilize water miscible low boiling solvents. See column 4, lines 53-54. Thus, EP 475 596 suggests use of a single phase aqueous medium, thereby teaching away from the liquid cleaning compositions of the present claims.

In addition or in the alternative, EP 475 596 does not teach or suggest a single liquid cleaning composition that is capable of highly effectively removing both hydrophilic and hydrophobic contaminants from the object to be cleaned, or methods for cleaning objects contaminated with hydrophobic and hydrophilic contaminants in a single step. Instead, EP 475 596 requires a terpene solvent and a separate aqueous medium to remove hydrophobic and hydrophilic contaminants, respectively, thereby teaching away from the present claims, which provide particularly useful and efficient cleaning methods, because hydrophobic and hydrophilic contaminants can be effectively removed in a single cleaning step using a single liquid cleaning composition.

In addition or in the alternative, to the extent that the Examiner contends that the aqueous medium taught by EP 475 596 is similar to the liquid cleaning compositions of the present claims, it is noted that EP 475 596 does not teach contacting the aqueous medium with a previously substantially uncleaned object, as recited in claims 70 and 83. Instead, the aqueous medium of EP 475 596 contacts an object that has already been substantially cleaned by the terpene solvent. Thus, these claims are distinguishable

from EP 475 596 for this reason as well.

Based upon one or more of the foregoing reasons, the present claims are believed to be patentably distinguishable from EP 475 596 and withdrawal of this rejection is respectfully requested. It is noted that the present claims provide several points of novelty as compared to EP 475 596. However, any one point is sufficient to provide patentability and Applicants do not contend in any way that all points of novelty noted above are essential to the invention. Instead, Applicant has identified several points of novelty to demonstrate that EP 475 596 is no longer relevant to the present method claims for a variety of independent reasons. Moreover, additional points of novelty have been recited in the dependent claims.

Claims 68, 48-50 and 53 also were rejected under 102(b) as being anticipated by WO 96/28535. Again, these claims have been canceled, but Applicants will provide arguments and evidence in order to overcome this rejection.

First, Applicant notes that this PCT publication is not available under 102(b), because the PCT publication date (September 19, 1996) of WO 96/28535 is less than 1 year before the international filing date for the present application (i.e., March 10, 1997), which international filing date serves as the earliest effective US filing date for the present application. Further, WO 96/28535 can not be available as a 102(e) reference, because the international filing date of WO 96/28535 is before November 29, 2000. MPEP 706.02(a) and 2136. Applicants note that US Patent No. 5,876,510, which resulted from the US national stage filing of WO 96/28535, identifies the 102(e) date of this patent as August 12, 1997, which is later than the earliest effective US filing date of

the present application. Naturally, because WO 96/28535 was filed earlier than November 29, 2000, the PCT publication cannot provide a 102(e) date. MPEP 706.02(a).

Thus, WO 96/28535 is only available as a 102(a) reference against the present application and has an effective date of September 19, 1996 (i.e., the publication date of WO 96/28535). In order to overcome the rejection based upon WO 96/28535, Applicants will submit a declaration of the inventors under Rule 131, which proves that the inventors actually reduced to practice the inventive subject matter of the present claims earlier than September 19, 1996 in a WTO country (i.e., Germany). See MPEP § 2132.01, last section. Therefore, the inventive activity of the inventors clearly antedates WO 96/28535. Consequently, because WO 96/28535 was not published before the date of this invention, as required by 102(a), the rejection based upon WO 96/28535 should be withdrawn.

As noted in the enclosed Rule 131 declaration, the inventive acts occurred in Germany, which is a WTO country, and the effective date of WO 96/28535 is after January 1, 1996. Thus, such inventive acts are available to prove prior invention under Rule 131. MPEP 715. In addition, Applicants note that the present claims clearly are patentably distinct from the issued claims of US Patent No. 5,876,510. Thus, no interference question is raised by swearing behind the publication date of WO 96/28535, which later resulted in US Patent No. 5,876,510.

For these reasons, WO 96/28535 is no longer available as a reference against the present claims. However, even if WO 96/28535 were available as prior art against

the present claims, Applicants maintain that WO 96/28535 does not teach or suggest the present claims with sufficient specificity and in view of the unexpected results achieved by the present invention, the present claims are non-obvious over the teachings of WO 96/28535. However, because the Rule 131 declaration requires withdrawal of WO 96/28535 as a relevant reference, non-obviousness arguments and evidence will not be provided at this time in order to expedite the prosecution of this application.

Finally, it is noted that an IDS and Form PTO-1449 were filed on October 27, 2002, and listed 4 new references for consideration. Although this IDS was filed after the issuance of the present Office Action mailed October 21, 2002, Applicants paid the fee of \$180 pursuant to Rule 97. Therefore, the Examiner is kindly requested to consider these references at this time and return an initialed copy of this Form PTO-1449 with the next Action on the merits.

For all the foregoing reasons, an early Notice of Allowance is hereby respectfully requested for new claims 70-112.

Should the Examiner have any further comments or suggestions, the undersigned hereby respectfully requests an interview in order to discuss appropriate claim language that will place the application into condition for allowance.

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VERSION WITH MARKINGS TO SHOW CHANGES MADE:

IN THE SPECIFICATION:

Attached is a version of the specification with markings to show changes made. Also attached is a clean version of the specification incorporating the changes.

IN THE CLAIMS:

Claims 48-50, 53, 56-58, 60-64 and 69 are cancelled without prejudice. The following new claims are added.

71. (New) A method for cleaning a previously substantially uncleaned object comprising:

a) preparing a liquid cleaning composition comprising 65%-99% by weight water and at least one organic compound having lipophilic and hydrophilic groups, wherein the concentration of the at least one organic compound is greater than the solubility of the at least one organic compound in water, and wherein the at least one organic compound has the properties of:

iii) being completely soluble in water at a different concentration and at a temperature that is different from a cleaning temperature, so as to form an optically clear liquid at the different concentration and temperature, and

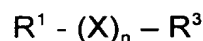
iv) highly efficiently dissolving and removing hydrophobic contaminants from the previously substantially uncleaned object,

b) adjusting the temperature of the liquid cleaning composition to the cleaning

temperature, and

c) contacting the previously substantially uncleaned object with the liquid cleaning composition at the cleaning temperature while maintaining the liquid cleaning composition in a state of an emulsion, in which a plurality of organic-rich droplets are suspended in a continuous aqueous phase, for at least a portion of the time that the liquid cleaning composition contacts the object by performing at least one of (i) agitating the liquid cleaning composition and (ii) applying ultrasound to the liquid cleaning composition, wherein both the organic-rich droplets and the continuous aqueous phase contact the object and both hydrophilic and hydrophobic contaminants are highly effectively removed from the object by the liquid cleaning composition.

71. (New) A method as in claim 70, wherein the at least one organic compound has the following structure:



wherein R^1 and R^3 are each independently selected from H; methyl; ethyl; linear or branched, saturated or unsaturated, C_3 to C_{18} alkyl groups, in which one or more nonadjacent $-CH_2-$ may be replaced by $-O-$; amino, in which one or more hydrogens may be replaced by C_1 to C_8 alkyl groups, or a saturated or unsaturated cyclic C_3 to C_6 group, in which one or more nonadjacent $-CH_2-$ groups may be replaced by $-O-$; hydroxy; and linear or branched, saturated or unsaturated, C_1 to C_8 alkoxy;

X is selected from the group consisting of $-O-$; $-C(=O)-$; $-C(=O)-O-$; $-NH-$, in which the hydrogen may be replaced by a linear or branched C_1 to C_8 alkyl group; $-N(-OH)-$; linear or branched C_1 to C_8 alkylene, in which one or more nonadjacent $-CH_2-$ groups

may be replaced by -O-; and

n is selected from a positive integer.

72. (New) A method as in claim 71, wherein R¹ and R³ are independently selected from hydrogen, methyl, ethyl, n-propyl, i-propyl, n-butyl, sec-butyl, i-butyl, tert-butyl, n-pentyl, n-hexyl, n-octyl, furfuryl-2, tetrahydrofurfuryl-2, hydroxy, methoxy, ethoxy and propoxy.

73. (New) A method as in claim 72, wherein X is selected from -O-; -C(=O)-; -C(=O)-O-; -NH-, in which the hydrogen may be replaced by a C₁ to C₈ alkyl group; -N(-OH)-; ethyleneoxy and propyleneoxy.

74. (New) A method as in claim 70, wherein the cleaning temperature is between about 40-60°C.

75. (New) A method as in claim 70, wherein the liquid cleaning composition is an azeotrope.

76. (New) A method as in claim 70, wherein the liquid cleaning composition has the further property that the at least one organic compound completely dissolves in the water when the temperature of the liquid cleaning composition is lower than the cleaning temperature.

77. (New) A method as in claim 70, wherein the water comprises at least 75% by weight of the liquid cleaning composition.

78. (New) A method as in claim 70, wherein the water comprises at least 85% by weight of the liquid cleaning composition.

79. (New) A method as in claim 70, wherein the liquid cleaning composition further

comprises a corrosion inhibitor.

80. (New) A method as in claim 70, wherein the at least one organic compound comprises a glycol ether.

81. (New) A method as in claim 70, wherein the at least one organic compound comprises dipropyleneglycol mono-n-propyl ether.

82. (New) A method as in claim 70, wherein the liquid cleaning composition further comprises at least one compound selected from the group consisting of an amine compound, an N-heterocyclic compound and an organic acid.

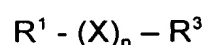
83. (New) A method for cleaning a previously substantially uncleaned object having hydrophobic and hydrophilic contaminants adhered thereto, the method comprising:

a) contacting the previously substantially uncleaned object with a liquid cleaning composition comprising 65%-99% by weight water and at least one organic compound having lipophilic and hydrophilic groups, wherein the concentration of the at least one organic compound is greater than the solubility of the at least one organic compound in water, such that the liquid cleaning composition is a two-phase solution at a cleaning temperature, and wherein the liquid cleaning composition has the properties of:

- iii) the at least one organic compound being completely soluble in water at a different concentration and at a temperature that is different from the cleaning temperature, so as to form an optically clear liquid at the different concentration and temperature, and
- iv) highly efficiently dissolving and removing both hydrophobic and hydrophilic contaminants from the object, and

b) maintaining the liquid cleaning composition in the state of an emulsion, in which a plurality of organic-rich droplets are suspended in a continuous aqueous phase, for at least a portion of the time that the liquid cleaning composition contacts the object, wherein both the organic-rich droplets and the continuous aqueous phase contact the object and both hydrophilic and hydrophobic contaminants are highly effectively removed from the object by the liquid cleaning composition.

84. (New) A method as in claim 83, wherein the at least one organic compound has the following structure:



wherein R^1 and R^3 are each independently selected from H; methyl; ethyl; linear or branched, saturated or unsaturated, C_3 to C_{18} alkyl groups, in which one or more nonadjacent $-CH_2-$ may be replaced by $-O-$; amino, in which one or more hydrogens may be replaced by C_1 to C_8 alkyl groups, or a saturated or unsaturated cyclic C_3 to C_6 group, in which one or more nonadjacent $-CH_2-$ groups may be replaced by $-O-$; hydroxy; and linear or branched, saturated or unsaturated, C_1 to C_8 alkoxy;

X is selected from the group consisting of $-O-$; $-C(=O)-$; $-C(=O)-O-$; $-NH-$, in which the hydrogen may be replaced by a linear or branched C_1 to C_8 alkyl group; $-N(-OH)-$; linear or branched C_1 to C_8 alkylene, in which one or more nonadjacent $-CH_2-$ groups may be replaced by $-O-$; and

n is selected from a positive integer.

85. (New) A method as in claim 84, wherein R^1 and R^3 are independently selected from hydrogen, methyl, ethyl, n-propyl, i-propyl, n-butyl, sec-butyl, i-butyl, tert-butyl, n-

pentyl, n-hexyl, n-octyl, furfuryl-2, tetrahydrofurfuryl-2, hydroxy, methoxy, ethoxy and propoxy.

86. (New) A method as in claim 85, wherein X is selected from -O-; -C(=O)-; -C(=O)-O-; -NH-, in which the hydrogen may be replaced by a C₁ to C₈ alkyl group; -N(-OH)-; ethyleneoxy and propyleneoxy.

87. (New) A method as in claim 83, wherein the cleaning temperature is between about 40-60°C.

88. (New) A method as in claim 83, wherein the liquid cleaning composition is maintained in the state of a plurality of organic-rich droplets suspended in a continuous aqueous phase by at least one of (i) agitating the liquid cleaning composition and (ii) applying ultrasound to the liquid cleaning composition.

89. (New) A method as in claim 83, wherein the liquid cleaning composition is an azeotrope.

90. (New) A method as in claim 83, wherein the liquid cleaning composition has the further property that the at least one organic compound completely dissolves in the water when the temperature of the liquid cleaning composition is lower than the cleaning temperature.

91. (New) A method as in claim 83, wherein the water comprises at least 75% by weight of the liquid cleaning composition.

92. (New) A method as in claim 83, wherein the water comprises at least 85% by weight of the liquid cleaning composition.

93. (New) A method as in claim 83, wherein the liquid cleaning composition further

comprises a corrosion inhibitor.

94. (New) A method as in claim 83, wherein the at least one organic compound comprises a glycol ether.

95. (New) A method as in claim 83, wherein the at least one organic compound comprises dipropyleneglycol mono-n-propyl ether.

96. (New) A method as in claim 83, wherein the liquid cleaning composition further comprises at least one additional compound selected from the group consisting of an amine compound, an N-heterocyclic compound and an organic acid.

97. (New) A method for cleaning an object comprising:

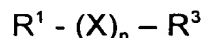
contacting the object with a liquid cleaning composition comprising 65%-99% by weight water and at least one organic compound having lipophilic and hydrophilic groups, wherein the concentration of the at least one organic compound is greater than the solubility of the at least one organic compound in water, such that the liquid cleaning composition is a two-phase solution at a cleaning temperature, and

maintaining the liquid cleaning composition in the state of an emulsion, in which a plurality of organic-rich droplets are suspended in a continuous aqueous phase, for at least a portion of the time that the liquid cleaning composition contacts the object at the cleaning temperature, wherein both the organic-rich droplets and the continuous aqueous phase contact the object and both hydrophilic and hydrophobic contaminants are highly effectively removed from the object by the liquid cleaning composition.

98. (New) A method as in claim 97, wherein the liquid cleaning composition is maintained in the state of a plurality of organic-rich droplets suspended in a continuous

aqueous phase by at least one of (i) agitating the liquid cleaning composition and (ii) applying ultrasound to the liquid cleaning composition.

99. (New) A method as in claim 98, wherein the at least one organic compound has the structure:



wherein R^1 and R^3 are each independently selected from H; methyl; ethyl; linear or branched, saturated or unsaturated, C_3 to C_{18} alkyl groups, in which one or more nonadjacent $-CH_2-$ may be replaced by $-O-$; amino, in which one or more hydrogens may be replaced by C_1 to C_8 alkyl groups, or a saturated or unsaturated cyclic C_3 to C_6 group, in which one or more nonadjacent $-CH_2-$ groups may be replaced by $-O-$; hydroxy; and linear or branched, saturated or unsaturated, C_1 to C_8 alkoxy;

X is selected from the group consisting of $-O-$; $-C(=O)-$; $-C(=O)-O-$; $-NH-$, in which the hydrogen may be replaced by a linear or branched C_1 to C_8 alkyl group; $-N(-OH)-$; linear or branched C_1 to C_8 alkylene, in which one or more nonadjacent $-CH_2-$ groups may be replaced by $-O-$; and

n is selected from a positive integer.

100. (New) A method as in claim 99, wherein R^1 and R^3 are independently selected from hydrogen, methyl, ethyl, n-propyl, i-propyl, n-butyl, sec-butyl, i-butyl, tert-butyl, n-pentyl, n-hexyl, n-octyl, furfuryl-2, tetrahydrofurfuryl-2, hydroxy, methoxy, ethoxy and propoxy.

101. (New) A method as in claim 100, wherein X is selected from $-O-$; $-C(=O)-$; $-C(=O)-O-$; $-NH-$, in which the hydrogen may be replaced by a C_1 to C_8 alkyl group; $-N(-$

OH)-; ethyleneoxy and propyleneoxy.

102. (New) A method as in claim 101, wherein the water comprises at least 75% by weight of the liquid cleaning composition.

103. (New) A method as in claim 102, wherein the water comprises at least 85% by weight of the liquid cleaning composition.

104. (New) A method as in claim 101, wherein the liquid cleaning composition further comprises a corrosion inhibitor.

105. (New) A method as in claim 104, wherein the at least one organic compound comprises a glycol ether.

106. (New) A method as in claim 105, wherein the liquid cleaning composition further comprises at least one additional compound selected from the group consisting of an amine compound, an N-heterocyclic compound and an organic acid.

107. (New) A method as in claim 106, wherein the at least one organic compound comprises dipropyleneglycol mono-n-propyl ether.

108. (New) A method as in claim 97, wherein the at least one organic compound is selected from the group consisting of propyleneglycol ether; dipropyleneglycolmonoethylether; tripropyleneglycolmonomethylether; 3-methoxy-3-methylbutanol; furfuryl alcohol; tetrahydrofurfurylalcohol; 1-aminobutanol-2; monoisopropanolamine; 2-amino-2-methylpropanol-1; 2-amino-2-methylpropanediol-1,3; 3-(aminomethyl)-pyridine; ethanolamine; furfurylamine; methyl lactate; isopropyl lactate; aminoacetaldehydedimethylacetal; 4-aminomorpholine; 1-methylimidazole; 1,2-dimethylimidazole; 1-vinylimidazole; 1,4-diazabicyclo[2.2.2]octane (DABCO); 1,5-

diazabicyclo[4.3.0]non-5-ene; and 1,8-diazabicyclo[5.4.0]undec-7-ene.

109. (New) A method as in claim 108, wherein the liquid cleaning composition further comprises at least one additional compound selected from the group consisting of an amine compound, an N-heterocyclic compound and an organic acid.

110. (New) A method as in claim 109, wherein the at least one organic compound comprises between 3 and 25% by weight of the liquid cleaning composition.

111. (New) A method as in claim 110, wherein the at least one organic compound comprises between 4 and 15% by weight of the liquid cleaning composition.

112. (New) A method as in claim 97, wherein the at least one organic compound comprises between 3 and 25% by weight of the liquid cleaning composition